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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,642	02/05/2004	Roger Keith Stager	ALA-PT014	5773

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VOLPE AND KOENIG, P.C. NET APP
30 S. 17TH STREET
UNITED PLAZA, SUITE 1600
PHILADELPHIA, PA 19103

EXAMINER	
TSUI, DANIEL	
ART UNIT	**PAPER NUMBER**
2185	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/28/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/772,642	STAGER ET AL.	
	Examiner	Art Unit	
	Daniel Tsui	2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2006 and 06 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 12-24* is/are rejected.

7)☒ Claim(s) *7-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/14/06 and 7/27/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statements (IDS) submitted on July 27, 2006 and December 14, 2006 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Oath/Declaration

2. The declaration filed on July 9, 2004 has been considered and accepted by the examiner.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-24 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-16 of copending Application No. 10/771,613 and claims 1-22 of copending Application No. 10/772,017. Although the conflicting claims are not identical, they are not patentably distinct from each other because the copending references teach the claimed subject matter and all sets of claims are directed to the system and method of providing continuous data protection.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Drawings

5. The drawings have been considered and accepted by the examiner.

Specification

6. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

7. The abstract has been considered and accepted by the examiner.

8. The specification has been considered and accepted by the examiner.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 13-24 rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The evidence that 35 U.S.C. 112, sixth paragraph, has been invoked is rebutted by the evidence in the specification. The means language presented in the claims is not accompanied by corresponding structure in the specification and appear to be software per se. As such, the claims fail to point out the structure of the claimed system.

Claim Rejections - 35 USC § 101

11. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 13-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. As disclosed in the specification, the claimed means appear to correspond only to software per se without any accompanying structure. A claim towards software per se does not fall within a statutory class of invention as it is not a process, machine, manufacture, or composition of matter.

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 1, 2, 13, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Crockett (US 6,578,120).

As per claims 1 and 13, Crockett teaches a method and a system for synchronizing a secondary volume with a primary volume that comprises the steps and means for:

scanning a region of the primary volume (see column 8, lines 55-57);

comparing the scanned region with a corresponding region of the secondary volume (see column 8, line 67 to column 9, line 2);

storing an identification of the scanned region in a compare delta map when the comparing step results in a discrepancy between the scanned region and the corresponding region (record sets, see column 8, lines 28-30 and lines 61-63);

copying data from the primary volume to the secondary volume, using the compare delta map as a guide to locate the data to copy (see column 8, lines 39-41).

As per claims 2 and 14, the reference teaches repeating the scanning, comparing, and storing steps for each region of the primary volume (see column 9, line 10).

13. Claims 12 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Colgrove (US PGPub 2005/0144407).

Colgrove teaches a method and system for restoring a primary volume from a secondary volume in a continuous data protection system that comprises the steps and means for:

selecting a snapshot of the primary volume to be restored (see paragraph 66, lines 6-7); and

loading the snapshot from the secondary volume to the primary volume (see paragraph 66, lines 8-13).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claims 3, 4, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crockett in view of Yamagami (US 7,111,136).

Crockett teaches a method and system for synchronizing a secondary volume with a primary volume in a continuous data protection system as applied to claims 1 and 13 above.

As per claims 3 and 15, Crockett does not teach creating a present delta map or creating a point in time map. Yamagami teaches a method and system that uses present delta maps (journals; see figure 5 and column 8, lines 45-47) to cover the changes made to a primary volume from the time of a previous delta map in a delta map chain (a sequence of journal entries, see figure 5). Yamagami also teaches creating a point in time map (snapshot; see figure 5 and column 8, lines 51-53, and line 61) based upon the present delta map. Therefore it would have been obvious at the time the invention was made to a person of ordinary skill in the art for the method and system taught by Crockett to create delta maps so each update can be tracked in sequence and to create a point in time map based on the delta maps so that all the updates can be combined to show a snapshot of the updated data volume. It would have also been obvious for the creating steps to be performed prior to the scanning step so that a comparison can be made during the scanning step of the primary volume to the update snapshot.

As per claims 4 and 16, it would have been obvious at the time the invention was made to a person of ordinary skill in the art to use the PIT map to determine which region of the secondary volume is compared to the scanned region of the primary

volume so that the data on both volumes can be updated to reflect the state of the PIT map.

16. Claims 5, 6, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crockett in view of Viswanathan (US 6,654,912).

Crockett teaches a method and system for synchronizing a secondary volume with a primary volume in a continuous data protection system as applied to claims 1 and 13 above. Crockett does not teach using a dirty region log to optimize the step of scanning and comparing. Viswanathan teaches using a dirty region log to keep track of which blocks in a volume have been changed so that a mirroring operation can be optimized to only copy the "dirty" files (see column 1, lines 55-59). Therefore it would have been obvious at the time the invention was made to a person of ordinary skill in the art to optimize the scanning and comparing by using a dirty region log, wherein only those regions of the primary volume that are listed in the dirty region log are scanned and compared so that system resources will not be wasted on unnecessarily scanning and comparing unmodified regions. The dirty region log would include only the regions of the primary volume that have been modified but not yet committed to the secondary volume since these are the dirty regions that the synchronizing would need to be performed on.

Allowable Subject Matter

17. Claims 7-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Winokur (US 6,625,704) teaches intercepting write commands that are receiving during a copying process and copying them to the secondary volume out-of order (see column 2, lines 22-38). Squibb (US 6,301,677) teaches halting incoming events during a mirroring process. The prior art of record does not teach or suggest **revising** the compare delta map by **removing** any changes made to the primary volume during a **scan interval**. The prior art also does not teach or suggest the use of a **scan delta map**, **host change delta map**, or **fix-up delta map**.

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Factor (US 7,055,009) teaches a method, system, and program for establishing a point-in-time copy.

Lubbers (US 6,915,397) teaches a system and method for generating point in time storage copy.

McCall (US 6,658,435) teaches disk image backup/restore with data preparation phase.

Brough (US 6,850,964) teaches methods for increasing cache capacity utilizing delta data.

Blount (US 5,875,479) teaches method and means for making a dual volume level copy in a DASD storage subsystem subject to updating during the copy interval.

Phelps (US 7,100,089) teaches determining differences between snapshots.

Haase (US 7,096,331) teaches system and method for managing data associated with copying and replication procedures in a data storage environment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Tsui whose telephone number is (571)270-1022. The examiner can normally be reached on M through F, 8:00-4:30 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571)272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DT

HONG CHONG KIM
PRIMARY EXAMINER

Daniel Tsui
Patent Examiner
Art Unit 2185